

PICTURE OF THE MONTH

"Sunglint"

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The ocean surface usually appears dark in satellite pictures because of its low reflectivity in visible light. However, when the water surface is viewed in such a way that specular reflection of the sun enters the satellite cameras, the water will appear bright. The degree of brightness and areal extent of this reflection will depend on the roughness of the water surface. An extremely smooth surface will act as a mirror and reflect all the incident light. If the reflected light enters the field of view of the satellite camera it will produce a small but bright reflection, but if this reflection lies outside the direct

field of view of the camera, the calm area will appear darker than the surrounding water. Increasingly rougher water surfaces are composed of more waves or reflecting surfaces. As a result, the rougher surfaces produce proportionately larger but less brilliant patterns.

The three ATS-3 photographs appearing as figures 1 through 3 illustrate the changes in a sunglint area within a 2-hr time span. In these pictures, the satellite field of view is stationary with respect to the earth, and the changes are the result of the westward progression of the sun. In figure 1, a large, rather diffuse "sunglint"

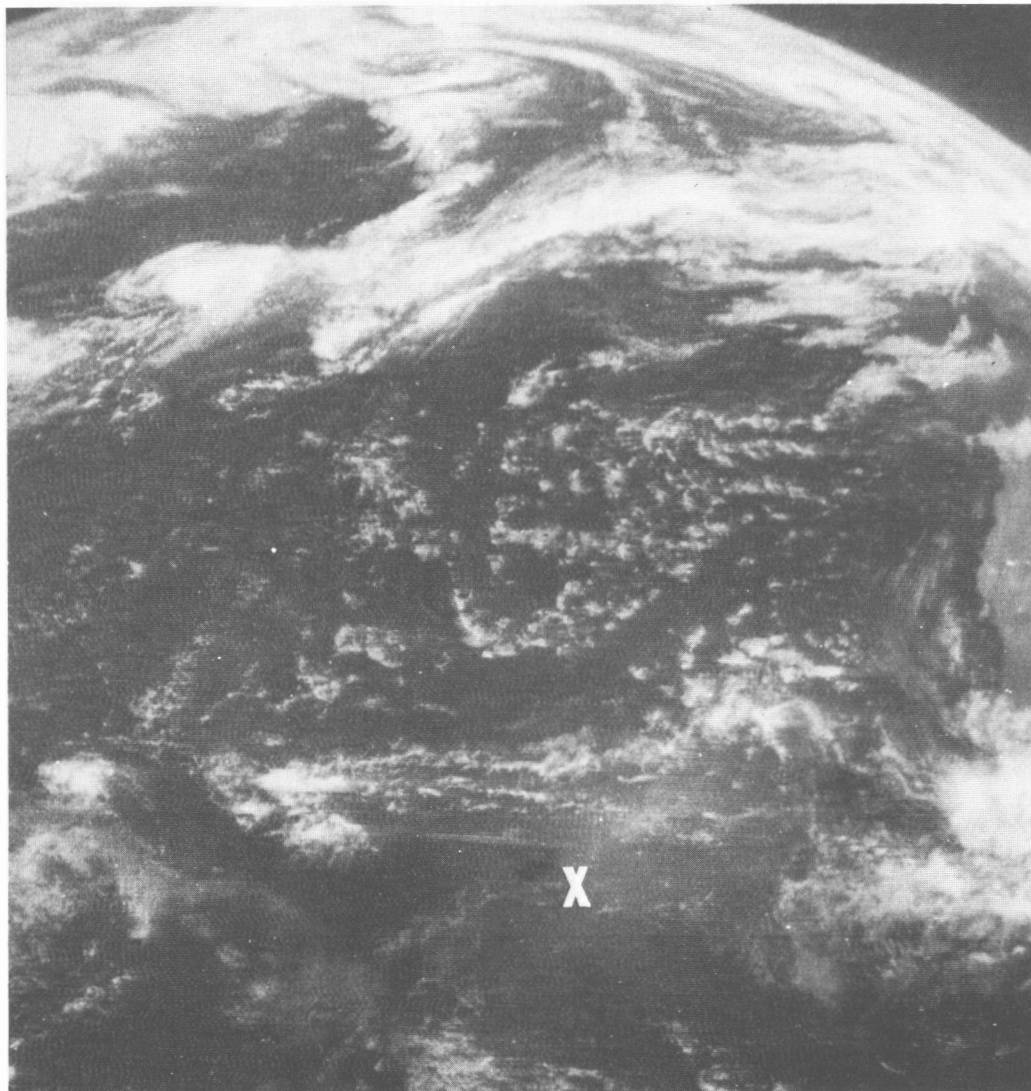


FIGURE 1.—ATS-3, 1332 GMT, Aug. 13, 1968.

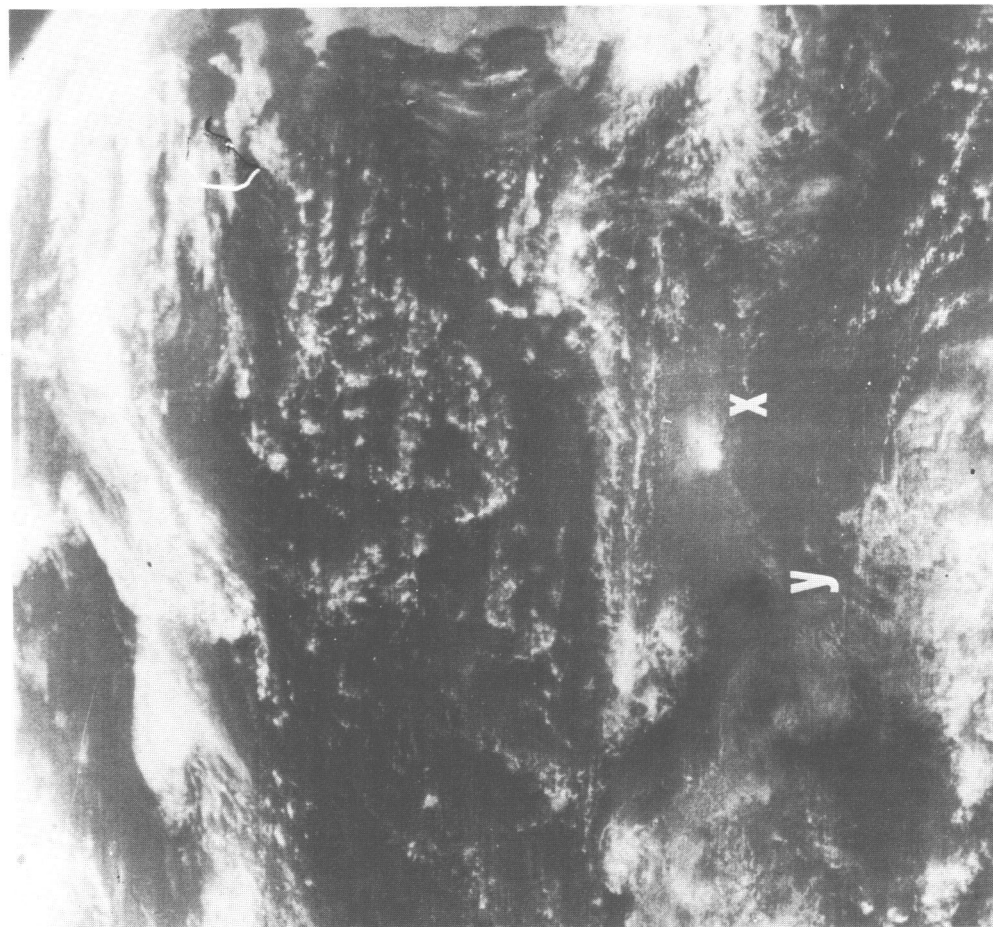


FIGURE 2.—ATS-3, 1426 GMT, Aug. 13, 1968.

area lies midway between Africa and South America. A small dark area (x) can be seen near the western edge of the sunglint. In the next picture (fig. 2), taken 64 min later, the sun has progressed far enough westward so that the specular reflection from this calm area (x) enters directly into the satellite camera. Thus the previously dark area appears bright. A second dark area (y) near South America can be seen along the edge of the sunglint. By 1530 GMT, the sunglint area has moved farther westward and lies just

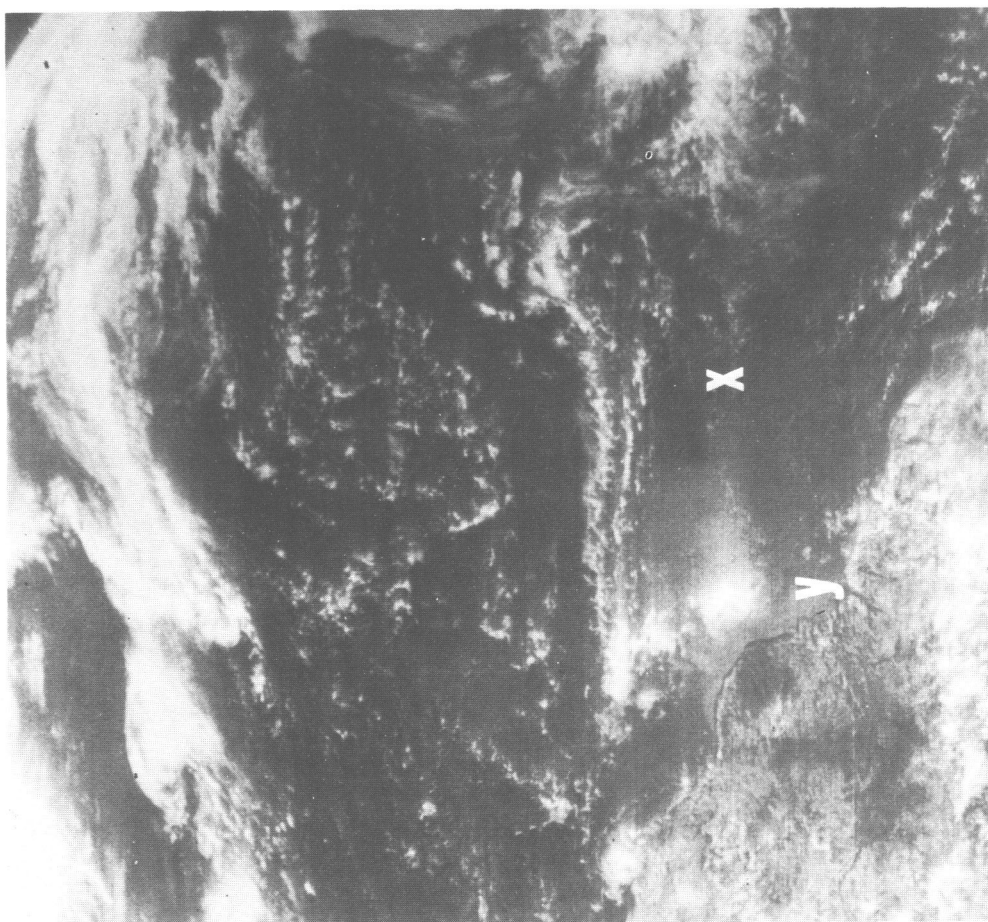


FIGURE 3.—ATS-3, 1530 GMT, Aug. 13, 1968.

off the coast of South America. Now the previously dark area (y) appears bright, while the area indicated as (x) appears dark again.

The size and brightness of sunglint areas are presently being studied. Preliminary results are most encouraging, and it is reasonable to hope that techniques based on observation of these areas will be developed in the near future to obtain accurate quantitative estimates of wind speed and state of the sea surface in data-sparse oceanic areas.